

# SACHITA NISHAL

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## EDUCATION

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### **Birla Institute of Technology and Science (BITS) Pilani, India**

*Aug '16 - Present*

Bachelor of Engineering (Honours), Computer Science

Current GPA : 8.08/10

### **Divine Child High School, Surat, India**

*Graduated May '16*

Central Board of Secondary Education (Science) Class 12

Overall Percentage: 97.2%

## RESEARCH PROJECTS AND INTERNSHIPS

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### **Research Assistant, Northwestern University**

*July '19 - Ongoing*

- Working under [Dr. Luis Amaral](#) to understand how creative ideas in films diffuse and evolve over time, and how they influence the cultural significance of films.
- Scraped textual data from [TV Tropes](#), employing bipartite networks, statistical testing and machine learning to qualify relationships between trope dynamics, genre norms, and the success of films.

### **Research Intern, Indian Institute of Science Bangalore**

*Dec '18 - May '19*

- Worked under [Dr. Rajiv Kumar Chaturvedi](#) and [Dr. Jaideep Joshi](#) to predict burnt area from forest fires, using the [Global Fire Emissions Database](#).
- Designed Artificial Neural Networks (ANN) and Long Short Term Memory (LSTM) models for prediction, and compared their performances over the dataset.

### **Undergraduate Research Project, BITS Pilani**

*Jan '18 - Dec '18*

- Worked under [Dr. Sukanta Mondal](#) to study network biomarkers and machine learning algorithms for disease classification.
- Pre-processed multi-class genetic expression data using Shannon's Entropy combined with PCA, and designed an ANN for the classification of lung cancer types.

### **Research Intern, Indian Institute of Technology (IIT), Madras**

*May '18 - July '18*

- Worked under [Dr. Karthik Raman](#) on using machine learning techniques for the prediction of protein-ligand binding affinities, for applications in drug design.
- Carried out a study of pre-existing methods that input 3D structural data of ligand-receptor complexes into Convolutional Neural Networks (CNNs) for predictions.
- Replicated several types of regression-based and classification-based CNNs from papers, using Tensorflow and PyTorch.

### **Undergraduate Research Project, BITS Pilani**

*Aug '17 - Dec '17*

- Worked under [Dr. Toby Joseph](#) to simulate the workings of the inner ear in humans, and reproduce its features qualitatively.
- Used MATLAB to model the inner ear hair cell as an RC circuit; the basilar membrane as a nonlinear damped oscillator, and neurotransmitter release at synapses as a Poisson process.

### **Research Intern, IISER, Pune**

*May '17 - July '17*

- Worked under [Dr. Sutirth Dey](#) to create evolutionary models of randomised genetic and epigenetic mutations in Wright-Fisher populations.

- Replicated a quantitative model in Python to account for mutations in gene pool. Graphed the resulting evolutionary dynamics to further the understanding of interplay of genetic and epigenetic factors in population fitness.

## AWARDS AND SCHOLARSHIPS

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### Summer Internship Award (SIA) 2018

*May '18*

- Received funding from BITS Pilani to pursue independent research activities in May-July 2018
- Competitive application (4 students out of >100 accepted), based on research proposal, scholastic excellence, and student productivity.

## LIST OF PUBLICATIONS AND POSTERS

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### Minimal Modelling of Primary Auditory Neuron Behaviour Synapsing to Inner Hair Cells

- Project poster presented with Dr. Toby Joseph at the 5th Complex Dynamical Systems and Applications Conference (CDSA 2017) at IIT, Guwahati

## RELEVANT COURSEWORK

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### Courses taken at BITS Pilani:

MATH F113: Probability and Statistics  
MATH F112: Linear Algebra and its Applications  
CS F211: Data Structures and Algorithms  
BITS F312: Neural Networks and Fuzzy Logic  
CS F415: Data Mining (ongoing)

### Courses taken online (Coursera, EdX etc.):

Neural Networks and Deep Learning  
Structuring Machine Learning Projects  
Improving Deep Neural Nets: Hyperparameter Tuning, Regularization and Optimisation  
Convolutional Neural Networks  
Natural Language Processing with Deep Learning  
Social and Economic Networks: Models and Analysis  
Introduction to Dynamical Systems and Chaos

## TEACHING, MENTORING AND LEADERSHIP

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### Teaching Assistant for **Environment, Development and Climate Change**

*Aug '18 - Dec '18*

- Assisted [Dr. Rajiv Kumar Chaturvedi](#), BITS Pilani, Goa
- Designed and helped evaluate assignments to gauge how students understood issues concerning climate change and climate policies in India.

### Editor and Speaker for **The BITS R&D Blog, BITS Pilani, Goa**

*Jan '18 - Present*

- Part of the student team that created and maintained this public blog. Wrote articles and gave short talks which detailed the technical research endeavours of BITS students and alumni.

## TECHNICAL SKILLS

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**Programming Languages:** Python 3, R, SQL, Java, C++, C, MATLAB

**Libraries/Tools:** Tensorflow, PyTorch, Keras, Scikit-Learn, NetworkX, BeautifulSoup

*\*Text in violet indicates hyperlink*